W. B. WILLARD.

Shuttle-Motion for Looms.

No. 208,873. Patented Oct. 8, 1878.

Fig. 1.

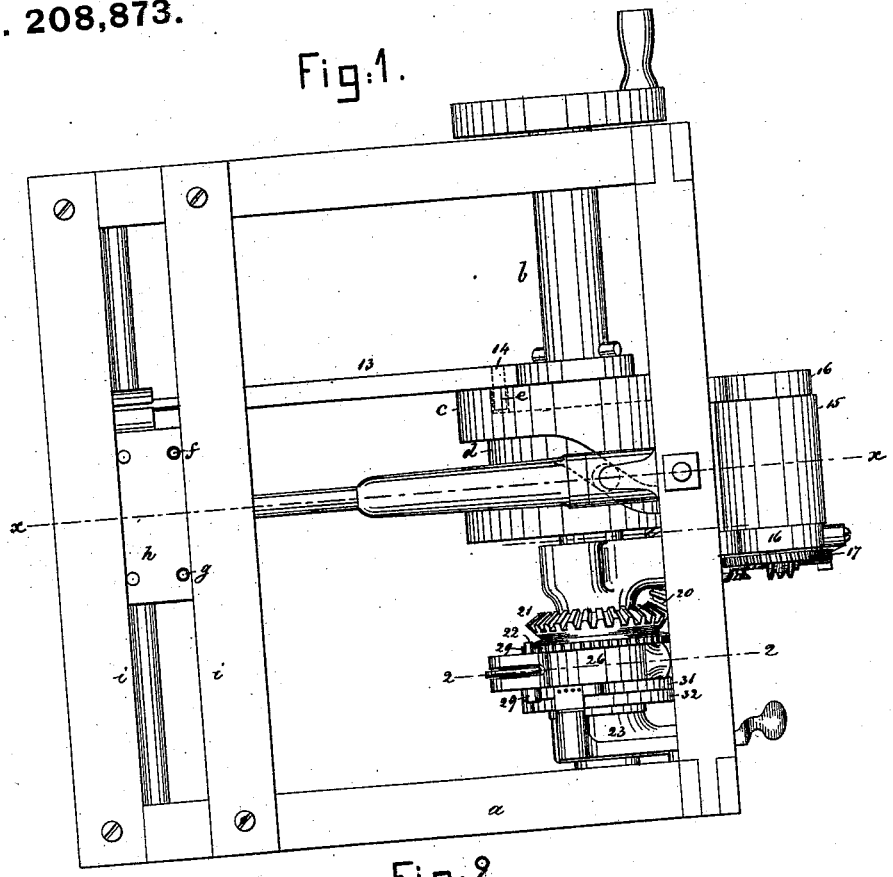


Fig. 2.

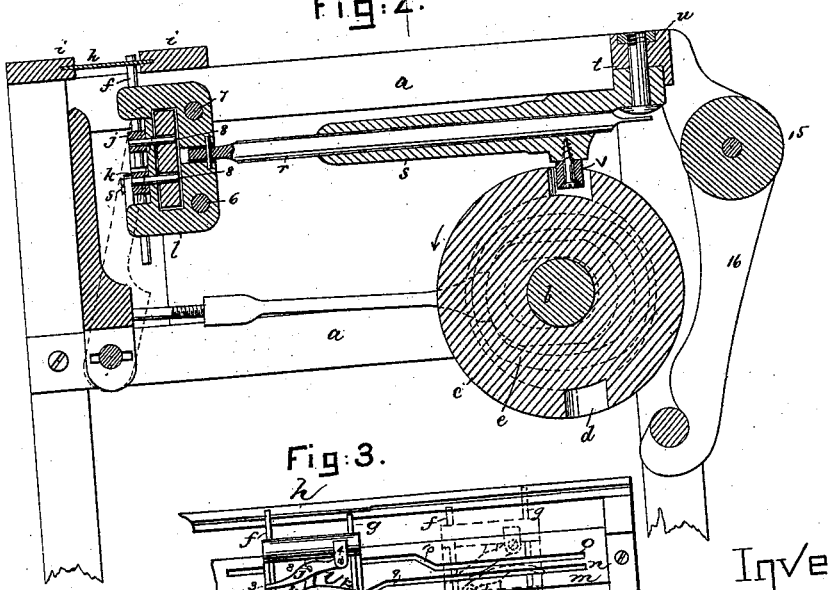
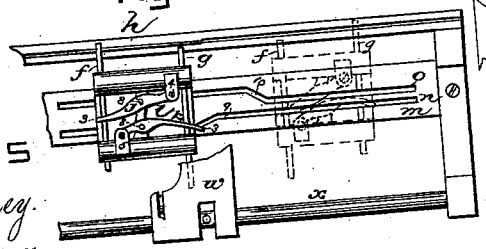


Fig. 3.



Witnesses

N. S. Whitney.

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UNITED STATES PATENT OFFICE.

WILLIAM B. WILLARD, OF NEW YORK, N. Y.

IMPROVEMENT IN SHUTTLE-MOTIONS FOR LOOMS.

Specification forming part of Letters Patent No. **208,873**, dated October 8, 1878; application filed July 29, 1878.

To all whom it may concern:

Be it known that I, WM. B. WILLARD, of New York, county of New York, State of New York, have invented an Improvement in Looms, of which the following description, taken in connection with the drawings forming a part thereof, is a specification.

This invention relates to improvements in shuttle-motions for looms; and the invention is shown as applied to a loom for weaving narrow goods, such as ribbons, tapes, &c.

The invention relates to a system of reciprocating pins and pivoted levers mounted upon a sliding carriage, the levers being provided near their fulcra, and between their ends, with friction rollers or studs, which enter cam-grooved ways, whereby the outer or free ends of the levers connected with the pins are moved a considerable distance, with but a slight rise in the cams, thereby making the movement of releasing, engaging, and carrying the shuttle an easy one.

The invention also consists in the combination, with the carrier provided with pins and levers, of a rod pivoted thereto and extended into the hollow or sleeve-like vibrating arm, the end of the rod extending through the sleeve to substantially the center of vibration of the arm, to thereby insure steadiness of motion without cramping.

Figure 1 of the drawing represents in plan view a sufficient portion of a loom to illustrate my invention; Fig. 2, a section thereof on the line *x x*, Fig. 1; Fig. 3, a front elevation, showing the shuttle-carrying devices and a portion of the lay-frame.

The frame *a* of the loom is made of suitable shape to sustain the working parts. *b* is the main shaft, driven in any usual way, and provided with a cam, *c*, having a peripherical cam-groove, *d*, to actuate the shuttle, and a side groove, *e*, as shown in dotted lines, Figs. 1 and 2, to actuate the lay.

The shuttle (not shown) will be of usual construction, preferably of metal, and will be provided with holes for the entrance of the driving-pins *f g*.

The plate *h* is supposed to represent the sole-plate of the shuttle, which will be guided in suitable grooves in the ways *i i*.

The shuttle will be engaged at one side of the warps by one pin, as shown in full lines at left of Fig. 3, while the other pin, drawn down, is crossing under the warps; but as soon as the pin in engagement with the shuttle reaches the warp, then the other pin, which has passed it, will be made to rise and engage the shuttle, and the other pin will be withdrawn. (See dotted lines, Fig. 3.) These pins *f g* are notched and embraced by the outer ends, 3, of the levers *j k*, pivoted at their other ends, at 4 5, to the slide or carrier *l*, sustained upon the guide-rods 6 7, which extend across the loom-frame. Embraced by this slide *l* is a bar or plate, *m*, provided with grooves *n o*, shaped as shown in Fig. 3; and pins 8, projected from the levers *j k* quite near their fulcra, and between the two ends of the levers, enter these slots, so that as the slide *l* is reciprocated by the inclines 9 10, which are not so abrupt as to jar the loom, a very little movement of the levers at the pins 8 will cause considerable movement of the pins, they operating so as to engage and release the shuttle properly. These levers *j k* are pivoted at opposite ends, and so curved, as shown in the drawing, that when the pins 8 are in the grooves *o n*, where the said grooves come closest together, the said levers can fit close to each other, thereby permitting the plate *m* to be made narrower than otherwise.

The slide *l* is moved from side to side of the loom by means of a rod, *r*, pivoted to it and extended through a tubular sleeve, *s*, pivoted at *t* to the breast-beam *u*, the said sleeve being vibrated by means of a friction-roller, *v*, thereon, which enters the groove *d* in the cam. This slide may carry one or more sets of pins to actuate one or more shuttles, according to the number of ribbons or tapes being woven.

The lay *w* has its fulcrum at *x*. It will be provided at top with a reed held thereto in any usual way, and it is vibrated by means of a link, 13, having a pin, 14, which enters the cam-groove *e* in the cam *c*.

The take-up devices shown in Fig. 1 form the subject-matter of another application, filed by me September 23, 1878, for Letters Patent.

I claim—

1. The shuttle-carrying slide, shuttle-engaging pins *f g*, and the levers *j k*, provided with pins 8, and connected at their ends most remote therefrom with the pins *f g*, in combination with the bar *m*, provided with cam-grooves *n o*, all to operate substantially as described.

2. The shuttle-carrying slide, its shuttle-engaging pins, and levers vibrated by cam-grooves to move the pins, combined with a rod connected with the slide, and a vibrating sleeve through which the rod is extended, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM B. WILLARD.

Witnesses:
G. W. GREGORY,
N. E. WHITNEY.